CLAIMS

I claim:

1. ~~A yieldable cushioning element comprising:~~

a quantity of gel cushioning media formed to have a top, a bottom, and an outer periphery, the cushioning media being compressible so that it will deform under the compressive force of a cushioned object, and

a plurality of hollow columns situated in said cushioning media, each of said columns having a longitudinal axis along its length, each of said columns having a column wall which defines a column interior, and each of said columns having a column top and a column bottom;

wherein the cushioning element is adapted to have a cushioned object placed in contact with said cushioning element top;

wherein the column top and the column bottom of one of said columns are located at two different points on said longitudinal axis of said column;

wherein said column's longitudinal axis is located generally parallel to the direction of a compressive force exerted on the cushioning element by a cushioned object in contact with said column top;

wherein at least one of said column walls is capable of buckling beneath a protuberance that is located on a cushioned object; and

wherein the cushioning element is yieldable as a result of compressibility of said cushioning media and bucklability of said column.

2. A cushioning element as recited in claim 1 wherein in at least one of said columns, said column top is open to said column interior.

3. A cushioning element as recited in claim 1 wherein in at least one of said columns, said column bottom is open to said column interior.

~~3. A cushioning element as recited in claim 1 wherein in at least one of said columns, both said column top and said column bottom are open to said column interior.~~

4. A cushioning element as recited in claim 3 wherein said column interior is hollow so that air may pass though said column to said column top in order to ventilate a cushioned object in contact with said top of the cushioning element.

5. A cushioning element as recited in claim 1 wherein said gel cushioning media is selected from the group consisting of gelatinous elastomers and gelatinous viscoelastomers.

6. A cushioning element as recited in claim 1 wherein said gel is non-flowable at normal usable temperatures of the cushioning element.

7. A cushioning element as recited in claim 1 wherein said gel cushioning media does not escape from a puncture on said cushioning element.

6
~~8~~. A cushioning element as recited in claim 1, wherein a cross section of one of said columns taken orthogonal to said longitudinal axis of said column has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, heptagonal, octagonal, round, oval, and n-sided polygonal where n is an integer.

7
~~9~~. A cushioning element as recited in claim 1, wherein a cross section of one of said columns taken orthogonal to said longitudinal axis of said column is hexagonal.

8
~~10~~. A cushioning element as recited in claim 1 wherein said cushioning element has shape memory so that when a cushioned object is removed from contact with the cushioning element, the cushioning element has a tendency to return to a shape that approximates the shape of the cushioning element before the

cushioning element and the cushioned object came into contact with each other.

9
~~11~~. A cushioning element as recited in claim 1 wherein said gel cushioning element is configured to have a low overall thermal mass and a low rate of thermal transfer in order to provide a comfortable cushioning element.

10
~~12~~. A cushioning element as recited in claim 1 wherein said periphery of the cushioning element has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, hexagonal, heptagonal, octagonal, round, oval, elliptical, heart-shaped, and n-sided polygonal.

11
~~13~~. A cushioning element as recited in claim 1 wherein said cushioning media includes a quantity of gas bubbles within it, said gas bubbles serving to increase the compressibility of the cushioning element.

12 11
~~14~~. A cushioning element as recited in claim ~~13~~ wherein said gas bubbles are dispersed throughout said cushioning media of the cushioning element.

13 11
~~15~~. A cushioning element as recited in claim ~~13~~ wherein a plurality of said gas bubbles are present in said column walls,

said gas bubbles in said column walls serving to decrease the level of compressive force required to be exerted on a column in order to cause the column to buckle.

14

~~16~~. A cushioning element as recited in claim 1 wherein a plurality of said column walls have openings in them to permit movement of a liquid or gas between adjacent columns.

15

~~17~~. A cushioning element as recited in claim 1 wherein at least one of said columns has a column interior that has a greater radial measurement orthogonal to the longitudinal axis of that column at a first point on the longitudinal axis of the column than at a second point on said longitudinal axis.

16

~~18~~. A cushioning element as recited in claim ~~17~~ 15 wherein said column is tapered between said column top and said column bottom.

17

~~19~~. A cushioning element as recited in claim ~~17~~ 15 wherein said column is stepped between said column top and said column bottom.

18

~~20~~. A cushioning element as recited in claim 1 wherein in at least one column, said column top and said column bottom are

sealed so that said column interior is not in fluid or air communication with a region outside of said column interior.

19 ~~21~~. A cushioning element as recited in claim 18 ~~20~~ wherein said column interior includes a quantity of fluid cushioning media within it.

20 ~~22~~. A cushioning element as recited in claim 1 wherein at least one of said columns has a column interior that contains a quantity of foam within it, said foam being selected from the group consisting of open cell foam and closed cell foam.

21 ~~23~~. A cushioning element as recited in claim 1 wherein at least one of said columns has a firmness protrusion located at its column bottom, said firmness protrusion being adapted to provide support within said column when said column buckles so that the cushioning element can readily yield in the vicinity of said column under a cushioned object until the cushioned object begins to compress said firmness protrusion, whereupon said firmness protrusion retards further movement of the cushioned object into the cushioning element.

22 ~~24~~. A cushioning element as recited in claim 1 wherein at least one of said columns is adapted to buckle by having a

portion of its column wall bulge outward away from the column interior.

23

~~25~~. A cushioning element as recited in claim 1 wherein at least one of said columns is adapted to buckle by having a portion of its column wall bulge inward toward the column interior.

24

~~26~~. A cushioning element as recited in claim 1 wherein at least one of said columns is adapted to yield along its longitudinal axis by buckling of its column wall.

25

~~27~~. A cushioning element as recited in claim 1, wherein the cushioning element has a total volume contained within the boundaries of the cushioning element top, bottom and outer periphery; and wherein said cushioning element total volume is occupied by not more than about 50% by volume of cushioning media.

26

~~28~~. A cushioning element as recited in claim 1 wherein said gel cushioning media is selected from the group consisting of elastomers and viscoelastomers.

27

~~29~~. A cushioning element as recited in claim ~~28~~ 26 wherein said gel cushioning media has a Shore A hardness of less than 15.

28 26
~~30~~. A cushioning element as recited in claim ~~28~~ wherein said gel cushioning media has a Shore A hardness of less than 3.

29 26
~~31~~. A cushioning element as recited in claim ~~28~~ wherein said gel cushioning media has a gram Bloom of less than 800.

30 26
~~32~~. A cushioning element as recited in claim ~~28~~ wherein said gel cushioning media comprises a high viscosity triblock copolymer.

31 30
~~33~~. A cushioning element as recited in claim ~~32~~ wherein said copolymer has the general configuration of poly(styrene-ethylene-butylene-styrene).

32 26
~~34~~. A cushioning element as recited in claim ~~28~~ wherein said gel cushioning media comprises about 100 parts by weight of a triblock copolymer and from about 200 to about 1600 parts by weight of a plasticizing oil.

33 32
~~35~~. A cushioning element as recited in claim ~~34~~ wherein said copolymer has the general configuration of poly(styrene-ethylene-butylene-styrene).

also 34
a4 ~~36~~. ~~A yieldable cushion comprising:~~
a4

a cushioning element having a top, a bottom, a center and a side wall, said cushioning element comprising a quantity of gelatinous cushioning media and a plurality of contiguous, adjacent hollow columns located within said cushioning media, said columns each having a column interior and a column wall,

a base configured to be placed in contact with said cushioning element bottom, said base being rigid in order to provide support beneath said cushioning element when a cushioned object is in contact with the cushion such that a compressive force is exerted against said cushioning element top by the cushioned object, and

a side wall support, said side wall support being configured to tend to constrain said side wall of said cushioning element from moving outward from said cushioning element center;

wherein said cushion is yieldable in response to a compressive force exerted upon it by a cushioned object; and

wherein said yieldability of the cushion results from said cushioning media being compressible and from said columns being bucklable, so that the cushion is able to substantially conform to the shape of a cushioned object.

35 ~~37~~. A cushion as recited in claim 34 ~~36~~ wherein in at least one of said columns, said column top is open to said column interior.

36 34
~~38~~. A cushion as recited in claim ~~26~~ wherein in at least one of said columns, said column bottom is open to said column interior.

37 34
~~39~~. A cushion as recited in claim ~~36~~ wherein in at least one of said columns, both said column top and said column bottom are open to said column interior.

38 37
~~40~~. A cushion as recited in claim ~~39~~ wherein said column interior is hollow so that air may pass though said column to said column top in order to ventilate a cushioned object in contact with said top of the cushioning element.

39 34
~~41~~. A cushion as recited in claim ~~36~~ wherein said gel cushioning media is selected from the group consisting of gelatinous elastomers and gelatinous viscoelastomers.

42. A cushion as recited in claim 36 wherein said gel is non-flowable at normal usable temperatures of the cushioning element.

~~43. A cushion as recited in claim 37 wherein said gel cushioning media does not escape from a puncture on said cushioning element.~~

40 34

44. A cushion as recited in claim 36, wherein a cross section of one of said columns taken orthogonal to said longitudinal axis of said column has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, heptagonal, octagonal, round, oval, and n-sided polygonal where n is an integer.

45. A cushion as recited in claim 36 wherein said cushioning element has shape memory so that when a cushioned object is removed from contact with the cushioning element, the cushioning element has a tendency to return to a shape that approximates the shape of the cushioning element before the cushioning element and the cushioned object came into contact with each other.

41 34

46. A cushion as recited in claim 36 wherein said gel cushioning element is configured to have a low overall thermal mass and a low overall rate of thermal transfer in order to provide a comfortable cushioning element.

42 34

47. A cushion as recited in claim 36 wherein said periphery of the cushioning element has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, hexagonal, heptagonal, octagonal, round, oval, elliptical, heart-shaped, and n-sided polygonal.

43 34
48. A cushion as recited in claim ~~36~~ wherein said cushioning media includes a quantity of gas bubbles within it, said gas bubbles serving to enhance the compressibility of the cushioning element.

44 43
49. A cushion as recited in claim ~~48~~ wherein said gas bubbles are dispersed throughout said cushioning media of the cushioning element.

45 44
50. A cushion as recited in claim ~~49~~ wherein a plurality of said gas bubbles are present in said column walls, said gas bubbles in said column walls serving to decrease the level of compressive force required to be exerted on a column in order to cause the column to buckle.

46 34
51. A cushion as recited in claim ~~36~~ wherein a plurality of said column walls have openings in them to permit movement of a liquid or gas between adjacent columns.

47 34
52. A cushion as recited in claim ~~36~~ wherein at least one of said columns has a column interior that has a greater radial measurement orthogonal to the longitudinal axis of that column at a first point on the longitudinal axis of the column than at a second point on said longitudinal axis.

48
~~53~~. A cushion as recited in claim ~~52~~ 47 wherein said column is tapered between said column top and said column bottom.

49
~~54~~. A cushion as recited in claim ~~53~~ 48 wherein said column is stepped between said column top and said column bottom.

50
~~55~~. A cushion as recited in claim ~~36~~ 34 wherein in at least one column, said column top and said column bottom are sealed so that said column interior is not in fluid or air communication with a region outside of said column interior.

51
~~56~~. A cushion as recited in claim ~~55~~ 50 wherein said column interior includes a quantity of fluid cushioning media within it.

52
~~57~~. A cushion as recited in claim ~~36~~ 34 wherein at least one of said columns has a column interior that contains a quantity of foam within it, said foam being selected from the group consisting of open cell foam and closed cell foam.

53
~~58~~. A cushion as recited in claim ~~36~~ 34 wherein at least one of said columns has a firmness protrusion located at its column bottom, said firmness protrusion being adapted to provide support within said column when said column buckles so that the cushioning element can readily yield in the vicinity of said column under a cushioned object until the cushioned object begins

to compress said firmness protrusion, whereupon said firmness protrusion retards further movement of the cushioned object into the cushioning element.

54 34

~~59~~. A cushion as recited in claim ~~36~~ wherein at least one of said columns is adapted to buckle by having a portion of its column wall bulge outward away from the column interior.

~~55~~ 34

~~60~~. A cushion as recited in claim ~~36~~ wherein at least one of said columns is adapted to buckle by having a portion of its column wall bulge inward toward the column interior.

56 34

~~61~~. A cushion as recited in claim ~~36~~ wherein at least one of said columns is adapted to yield along its longitudinal axis by buckling of its column wall.

57 34

~~62~~. A cushion as recited in claim ~~36~~, wherein the cushioning element has a total volume contained within the boundaries of the cushioning element top, bottom and outer periphery; and wherein said cushioning element total volume is occupied by not more than about 50% by volume of cushioning media.

58 (~~63~~). A cushion as recited in claim 34 (~~36~~) wherein said gelatinous cushioning media is selected from the group consisting of gelatinous elastomers and viscoelastomers.

59 (~~64~~). A cushion as recited in claim 34 (~~36~~) wherein said gel cushioning media has a Shore A hardness of less than 15.

60 (~~65~~). A cushion as recited in claim 34 (~~36~~) wherein said gel cushioning media has a Shore A hardness of less than 3.

61 (~~66~~). A cushion as recited in claim 34 (~~36~~) wherein said gel cushioning media has a gram Bloom of less than 800.

62 (~~67~~). A cushion as recited in claim 34 (~~36~~) wherein said gel cushioning media comprises a high viscosity triblock copolymer.

63 (~~68~~). A cushion as recited in claim 62 (~~67~~) wherein said copolymer has the general configuration of poly(styrene-ethylene-butylene-styrene).

64 (~~69~~). A cushion as recited in claim 34 (~~36~~) wherein said gel cushioning media comprises about 100 parts by weight of a triblock copolymer and from about 200 to about 1600 parts by weight of a plasticizing oil.

65 64
B 1 ~~70~~. A cushion as recited in claim ~~69~~ 72 wherein said copolymer
2 has the general configuration of poly(styrene-ethylene-butylene-
3 styrene).

66
A5 4 ~~71. A yieldable cushion comprising:~~
A5
5 a cushioning element having a top, a bottom, a center and an
6 outer periphery, said cushioning element comprising a quantity of
7 gelatinous cushioning media and a plurality of columns located
8 within said cushioning media, said columns each having a
9 longitudinal axis, a column interior and a column wall,
10 a container in which said cushioning element is placeable, said
11 container having a container base configured to be in contact
12 with said cushioning element bottom, said base being rigid in
13 order to provide support beneath said cushioning element when a
14 cushioned object is in contact with the cushion such that a
15 compressive force is exerted against said cushioning element top
16 by the cushioned object, said container also having a rigid outer
17 periphery support, said rigid outer periphery support being
18 configured to provide support to said cushioning element outer
19 periphery in order to impede its tendency to move outward away
20 from said cushioning element center when a cushioned object
21 exerts a compressive force on the cushion,

add 1 B' 1
22 ~~72. A cushion as recited in claim 71~~

wherein said cushion is yieldable in response to a compressive force exerted upon it by a cushioned object; and

wherein said yieldability of the cushion results from said cushioning media being compressible and from said columns being bucklable generally in the direction of their longitudinal axes, so that the cushion is able to substantially conform to the shape of a cushioned object.

67

~~73~~. A cushion as recited in claim ~~71~~ 66 wherein in at least one of said columns, said column top is open to said column interior.

68

~~74~~. A cushion as recited in claim ~~71~~ 66 wherein in at least one of said columns, said column bottom is open to said column interior.

69

~~75~~. A cushion as recited in claim ~~71~~ 66 wherein in at least one of said columns, both said column top and said column bottom are open to said column interior.

70

~~76~~. A cushion as recited in claim ~~75~~ 69 wherein said column interior is hollow so that air may pass though said column to said column top in order to ventilate a cushioned object in contact with said top of the cushioning element.

72 ~~77~~. A cushion as recited in claim ~~71~~ 66 wherein said gel cushioning media is selected from the group consisting of gelatinous elastomers and gelatinous viscoelastomers.

78. A cushion as recited in claim 72 wherein said gel is non-flowable at normal usable temperatures of the cushioning element.

~~79. A cushion as recited in claim 73 wherein said gel cushioning media does not escape from a puncture on said cushioning element.~~

71 ~~80~~. A cushion as recited in claim ~~75~~ 69, wherein a cross section of one of said columns taken orthogonal to said longitudinal axis of said column has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, heptagonal, octagonal, round, oval, and n-sided polygonal where n is an integer.

73 ~~81~~. A cushion as recited in claim ~~71~~ 66, wherein a cross section of one of said columns taken orthogonal to said longitudinal axis of said column has a hexagonal shape.

82. A cushion as recited in claim 72 wherein said cushioning element has shape memory so that when a cushioned

object is removed from contact with the cushioning element, the cushioning element has a tendency to return to a shape that approximates the shape of the cushioning element before the cushioning element and the cushioned object came into contact with each other.

74

~~83~~. A cushion as recited in claim ~~72~~ 66 wherein said gel cushioning element is configured to have a low overall thermal mass and a low overall rate of thermal transfer in order to provide a comfortable cushioning element.

75

~~84~~. A cushion as recited in claim ~~72~~ 66 wherein said periphery of the cushioning element has a shape selected from the group consisting of triangular, square, rectangular, pentagonal, hexagonal, heptagonal, octagonal, round, oval, elliptical, heart-shaped, and n-sided polygonal.

76

~~85~~. A cushion as recited in claim ~~72~~ 66 wherein said cushioning media includes a quantity of gas bubbles within it, said gas bubbles serving to enhance the compressibility of the cushioning element.

77

~~86~~. A cushion as recited in claim ~~85~~ 76 wherein said gas bubbles are dispersed throughout said cushioning media of the cushioning element.

78 76

87. A cushion as recited in claim 85 wherein a plurality of said gas bubbles are present in said column walls, said gas bubbles in said column walls serving to decrease the level of compressive force required to be exerted on a column in order to cause the column to buckle.

79 #66

88. A cushion as recited in claim 72 wherein a plurality of said column walls have openings in them to permit movement of a liquid or gas between adjacent columns.

80 #66

89. A cushion as recited in claim 72 wherein at least one of said columns has a column interior that has a greater radial measurement orthogonal to the longitudinal axis of that column at a first point on the longitudinal axis of the column than at a second point on said longitudinal axis.

81 80

90. A cushion as recited in claim 89 wherein said column is tapered between said column top and said column bottom.

82 80

91. A cushion as recited in claim 89 wherein said column is stepped between said column top and said column bottom.

83 #66

92. A cushion as recited in claim 72 wherein in at least one column, said column top and said column bottom are sealed so

that said column interior is not in fluid or air communication with a region outside of said column interior.

84 83
~~93~~. A cushion as recited in claim ~~92~~ wherein said column interior includes a quantity of fluid cushioning media within it.

85 66
~~94~~. A cushion as recited in claim ~~72~~ wherein at least one of said columns has a column interior that contains a quantity of foam within it, said foam being selected from the group consisting of open cell foam and closed cell foam.

86 66
~~95~~. A cushion as recited in claim ~~72~~ wherein at least one of said columns has a firmness protrusion located at its column bottom, said firmness protrusion being adapted to provide support within said column when said column buckles so that the cushioning element can readily yield in the vicinity of said column under a cushioned object until the cushioned object begins to compress said firmness protrusion, whereupon said firmness protrusion retards further movement of the cushioned object into the cushioning element.

87 66
~~96~~. A cushion as recited in claim ~~72~~ wherein at least one of said columns is adapted to buckle by having a portion of its column wall bulge outward away from the column interior.

88

97. A cushion as recited in claim ~~72~~ 66 wherein at least one of said columns is adapted to buckle by having a portion of its column wall bulge inward toward the column interior.

89

98. A cushion as recited in claim ~~72~~ 66 wherein at least one of said columns is adapted to yield along its longitudinal axis by buckling of its column wall.

90

99. A cushion as recited in claim ~~72~~ 66, wherein the cushioning element has a total volume contained within the boundaries of the cushioning element top, bottom and outer periphery; and wherein said cushioning element total volume is occupied by not more than about 50% by volume of cushioning media.

91

100. A cushion as recited in claim ~~72~~ 66 wherein said gel cushioning media is selected from the group consisting of elastomers and viscoelastomers.

92

101. A cushion as recited in claim ~~72~~ 66 wherein said gel cushioning media has a Shore A hardness of less than 15.

93

102. A cushion as recited in claim ~~72~~ 66 wherein said gel cushioning media has a Shore A hardness of less than 3.

94 (#66)

~~103~~. A cushion as recited in claim ~~72~~ wherein said gel cushioning media has a gram Bloom of less than 700.

95 (#66)

~~104~~. A cushion as recited in claim ~~72~~ wherein said gel cushioning media comprises a high viscosity triblock copolymer.

96 (95)

~~105~~. A cushion as recited in claim ~~104~~ wherein said copolymer has the general configuration of poly(styrene-ethylene-butylene-styrene).

97 (#66)

~~106~~. A cushion as recited in claim ~~72~~ wherein said gel cushioning media comprises about 100 parts by weight of a triblock copolymer and from about 200 to about 1600 parts by weight of a plasticizing oil.

98 (97)

~~107~~. A cushion as recited in claim ~~106~~ wherein said copolymer has the general configuration of poly(styrene-ethylene-butylene-styrene).

99

~~108~~. ~~A yieldable cushion comprising:~~ a cushioning element having a top, a bottom, a center and a side wall, said cushioning element comprising a quantity of gelatinous cushioning media and a plurality of columns located within said cushioning media, said columns each having longitudinal axis, a column interior and a column wall,

a base configured to be placed in contact with said cushioning element bottom, said base providing support beneath said cushioning element when a cushioned object is in contact with the cushion such that a compressive force is exerted against said cushioning element top by the cushioned object, and

a cover adapted to cover and protect said cushioning element;

wherein said cushion is yieldable in response to a compressive force exerted upon it by a cushioned object; and

wherein said yieldability of the cushion results from said cushioning media being compressible and from said columns being bucklable in the direction of their longitudinal axes, so that the cushion is able to substantially conform to the shape of a cushioned object.

100

~~109~~. A cushion as recited in claim ~~108~~ 99 wherein said cover is an elastic cover that permits air flow between said cushioning element top and a cushioned object adjacent thereto.

101

~~110~~. A cushion as recited in claim ~~108~~ 99 further comprising:

a side wall support, said side wall support being configured to tend to constrain said side wall of said cushioning element from moving in an outward direction.

102 99

~~111~~. A cushion as recited in claim ~~108~~ wherein said sidewall support is a rigid plate adapted to be placed between said cover and said cushioning element.

103

~~112~~. ~~A yieldable~~ cushion comprising:

a cushioning element having a top, a bottom, a center and an outer periphery, said cushioning element comprising a quantity of gelatinous cushioning media and a plurality of columns located within said cushioning media, said columns each having a longitudinal axis, a column interior and a column wall, and

a girdle placeable about said outer periphery of said cushioning element, said girdle serving to retard movement of said outer periphery when a cushioned object exerts a compressive force on the cushioning element,

wherein said cushion is yieldable in response to a compressive force exerted upon it by a cushioned object; and

wherein said yieldability of the cushion results from said cushioning media being compressible and from said columns being bucklable generally in the direction of their longitudinal axes, so that the cushion is able to substantially conform to the shape of a cushioned object.

104 103

~~113~~. A cushion as recited in claim ~~112~~ wherein said girdle is a strap.

105

~~114. A yieldable cushioning element comprising:~~

a quantity of gel cushioning media formed to have a top, a bottom, and an outer periphery, the cushioning media being compressible so that it will deform under the compressive force of a cushioned object, and

a plurality of hollow columns situated in said cushioning media, each of said columns having a longitudinal axis along its length, each of said columns having a column wall which defines a column interior, and each of said columns having a column top and a column bottom;

wherein the cushioning element is adapted to have a cushioned object placed in contact with said cushioning element top;

wherein the column top and the column bottom of one of said columns are located at two different points on said longitudinal axis of said column;

wherein said column's longitudinal axis is located generally parallel to the direction of a compressive force exerted on the cushioning element by a cushioned object in contact with said column top;

wherein at least one of said columns is capable of buckling beneath a protuberance that is located on a cushioned object;

wherein the cushioning element is yieldable as a result of compressibility of said cushioning media and bucklability of said column;

wherein said cushioning media comprises thermoplastic, heat formable and heat reversible gelatinous elastomer composition, G, which is physically interlocked with a selected material Mn, said gelatinous elastomer composition formed from (a) 100 parts by weight of a high viscosity triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene); (b) from about 200 to about 1,600 parts by weight of a plasticizing oil; said composition characterized by a gel rigidity of from about 20 to about 800 gram Bloom; said composition formed from the combination GnMnGn, MnGnMn, MnGnGn, GnGnMn, MnGnGnMn, GnMnGnGn, GnMnMnGn, GnMnMnGn, GnGnMnMn, GnGnMnGnMn, GnMnGnGn, GnGnMn, GnMnGnMnMn, MnGnMnGnMnGn, GnGnMnMnGn, or GnGnMnGnMnGn, wherein when n is a subscript of M, n is selected from the group consisting of foam, plastic, fabric, metal, concrete, wood, glass, ceramics, synthetic resin, synthetic fibers or refractory materials; and

wherein when n is a subscript of G, n denotes the same or a different gel rigidity.

106 105

~~115~~. A cushioning element as recited in claim ~~114~~ wherein said styrene end block to ethylene and butylene center block ratio is from about 20:80 to about 40:60.

107 105

~~116~~. A cushioning element as recited in claim ~~114~~, wherein said triblock copolymer is characterized by a Brookfield

Viscosity of a 20 weight percent solids solution in toluene at 25° C. of substantially greater than 1,800 cps.

108 105

~~117~~. A cushioning element as recited in claim ~~114~~ wherein said cushioning media is a gelatinous elastomer composition comprising:

(a) about 100 parts by weight of a triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene) wherein said styrene end block to ethylene and butylene center block ratio is within the range of from between 31:69 to 40:60;

(b) from about 200 to about 1,600 parts by weight of an plasticizing oil selected from the group consisting of petroleum paraffinic oils, petroleum naphthenic oils, synthetic polybutene oils, synthetic polypropene oils, synthetic polyterpene oils and mixtures thereof; said oils having an average molecular weight of between about 200 to about 800; and

(c) said gelatinous elastomer composition being characterized as having an elongation at break of at least about 1,600%, an ultimate tensile strength of at least about 8 x 10^5 dyne/cm^2 , and a gel rigidity of substantially not greater than about 800 gram Bloom.

109 108

~~118~~. A cushioning element as recited in claim ~~117~~ wherein said cushioning media exhibits the following properties:

(a) tensile strength of about 8 x 10^5 dyne/cm^2 to about 10^7 dyne/cm^2 as measured with crosshead separation speed of 25 cm per minute at 23° C.;

(b) elongation of about 1,600% to about 3,000% as measured with crosshead separation speed of 25 cm per minute at 23° C.;

(c) elasticity modulus of about 10^4 dyne/cm^2 to about 10^6 dyne/cm^2 as measured with crosshead separation speed of 25 cm per minute at 23° C.;

(d) shear modulus of about 10^4 dyne/cm^2 to about 10^6 dyne/cm^2 as measured with a 1, 2, and 3 kilogram load at 23° C.;

(e) gel rigidity of about 20 gram Bloom to about 800 gram Bloom as measured by the gram weight required to depress a gel a distance of 4 mm with a piston having a cross-sectional area of 1 square cm at 23° C.;

(f) tear propagation resistance of at least 5 x 10^5 dyne/cm^2 as measured at a crosshead separation speed of 25 cm/minute at 23° C.;

(g) and substantially 100% snap back recovery when extended at a crosshead separation speed of 25 cm/minute to 1,200% at 23° C.

110 105

~~119.~~ A cushioning element as recited in claim ~~114~~ wherein said cushioning media is a gelatinous elastomer composition consisting essentially of:

(a) about 100 parts by weight of a triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene)

wherein said styrene end block to ethylene and butylene center block ratio is about 32:68 to about 38:62;

(b) from about 200 to about 1,600 parts by weight of an plasticizing oil selected from the group consisting of petroleum paraffinic oils, petroleumnaphthenic oils, synthetic polybutene oils, synthetic polypropene oils, synthetic polyterpene oils and mixtures thereof; said oils having an average molecular weight of between about 200 to about 800; and

(c) said gelatinous elastomer composition being characterized as having an elongation at break of at least about 1,600%, an ultimate tensile strength of at least about 8×10^5 dyne/cm^2 , and a gel rigidity of substantially not greater than about 800 gram Bloom.

111 ~~120~~. A cushioning element as recited in claim ~~119~~ 110 wherein said cushioning media is a gelatinous elastomer composition comprising:

(a) about 100 parts by weight of a triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene) wherein said styrene end block to ethylene and butylene center block ratio is about 32:68 to about 36:64;

(b) from about 200 to about 1,600 parts by weight of an plasticizing oil selected from the group consisting of petroleum paraffinic oils, petroleum naphthenic oils, synthetic polybutene oils, synthetic polypropene oils, synthetic polyterpene oils and

mixtures thereof; said oils having an average molecular weight of between about 200 to about 800; and

(c) said gelatinous elastomer composition being characterized as having an elongation at break of at least about 1,600%, an ultimate tensile strength of at least about 8×10^5 dyne/cm^2 , and a gel rigidity of substantially not greater than about 800 gram Bloom.

112 111

~~121~~. A cushioning element as recited in claim ~~120~~, said cushioning media being a gelatinous elastomer composition comprising:

(a) about 100 parts by weight of triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene) wherein said styrene end block to ethylene and butylene center block ratio is within the range of from between 31:69 to 40:60;

(b) from about 200 to about 1,600 parts by weight of a plasticizing oil;

(c) said gelatinous elastomer composition having a gel rigidity of about 20 gram to about 800 gram Bloom.

113 112

~~122~~. A cushioning element as recited in claim ~~121~~ wherein said plasticizing oil is selected from the group consisting of petroleum paraffinic oils, petroleum naphthenic oils, and mixtures thereof.

114 112

~~123~~. A cushioning element as recited in claim ~~121~~ wherein said plasticizing oil is selected from the group consisting of synthetic polybutene oils, synthetic polypropene oils, synthetic polyterpene oils and mixtures thereof.

115 112

~~124~~. A cushioning element as recited in claim ~~121~~ wherein said plasticizing oil is selected from the group consisting of petroleum paraffinic oils, petroleum naphthenic oils, synthetic polybutene oils, synthetic polypropylene oils, synthetic polyterpene oils and mixtures thereof; said oils having an average molecular weight of between about 200 to about 800.

116 112

~~125~~. A cushioning element as recited in claim ~~121~~ wherein said oils having an average molecular weight of between about 200 to about 800.

117 112

~~126~~. A cushioning element as recited in claim ~~121~~ wherein said cushioning element exhibits high creep, craze, tear, and crack resistance and is substantially free from oil bleedout.

118

~~127~~. ~~A yieldable cushioning element comprising:~~

a quantity of gel cushioning media formed to have a top, a bottom, and an outer periphery, the cushioning media being compressible so that it will deform under the compressive force of a cushioned object, and

a plurality of hollow columns situated in said cushioning media, each of said columns having a longitudinal axis along its length, each of said columns having a column wall which defines a column interior, and each of said columns having a column top and a column bottom;

wherein the cushioning element is adapted to have a cushioned object placed in contact with said cushioning element top;

wherein the column top and the column bottom of one of said columns are located at two different points on said longitudinal axis of said column;

wherein said column's longitudinal axis is located generally parallel to the direction of a compressive force exerted on the cushioning element by a cushioned object in contact with said column top;

wherein at least one of said columns is capable of buckling beneath a protuberance that is located on a cushioned object;

wherein the cushioning element is yieldable as a result of compressibility of said cushioning media and bucklability of said column;

wherein the cushioning media is a gelatinous elastomer composition comprising:

(a) about 100 parts by weight of a high viscosity triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene);

(b) from about 200 to about 1,600 parts by weight of a plasticizing oil; said composition characterized by a gel rigidity of from about 20 to about 800 gram Bloom.

119

128. ~~A yieldable cushioning element comprising:~~

a10

a quantity of gel cushioning media formed to have a top, a bottom, and an outer periphery, the cushioning media being compressible so that it will deform under the compressive force of a cushioned object, and

a plurality of hollow columns situated in said cushioning media, each of said columns having a longitudinal axis along its length, each of said columns having a column wall which defines a column interior, and each of said columns having a column top and a column bottom;

wherein the cushioning element is adapted to have a cushioned object placed in contact with said cushioning element top;

wherein the column top and the column bottom of one of said columns are located at two different points on said longitudinal axis of said column;

wherein said column's longitudinal axis is located generally parallel to the direction of a compressive force exerted on the cushioning element by a cushioned object in contact with said column top;

wherein at least one of said columns is capable of buckling beneath a protuberance that is located on a cushioned object;

wherein the cushioning element is yieldable as a result of compressibility of said cushioning media and bucklability of said column;

wherein the cushioning media is a gelatinous elastomer composition comprising:

(a) about 100 parts by weight of a high viscosity triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene); said styrene to ethylene and butylene is of a ratio of from about 20:80 to about 40:60; and

(b) from about 200 to about 1,600 parts by weight of a plasticizing oil; said composition characterized by a gel rigidity of from about 20 to about 800 gram Bloom.

120 ~~129~~. A cushioning element as recited in claim 119 ~~128~~ wherein said triblock copolymer is characterized by a Brookfield Viscosity of a 20 weight percent solids solution in toluene at 25° C. of at least about 1,800 cps.